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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/610,966	07/01/2003	Oleg Kiselev	VRT0061US	1460

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CAMPBELL STEPHENSON ASCOLESE, LLP
4807 SPICEWOOD SPRINGS RD.
BLDG. 4, SUITE 201
AUSTIN, TX 78759

EXAMINER	
BRADLEY, MATTHEW A	
ART UNIT	**PAPER NUMBER**
2187 .	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/610,966	KISELEV ET AL.	
	Examiner	Art Unit	
	Matthew Bradley	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *05/24/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 24 May 2004 was filed after the mailing date of 1 July 2003 for application 10/610,966. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

- Paragraph 11 line 3 – "there for" A suggested change by the Examiner is "therefore".
- Paragraph 24 lines 4-5 – "inaccessible due hardware or software" is grammatically incorrect. A suggested change by the Examiner includes the words 'because of a' or 'to a' following the word "due".

- Paragraph 24 line 6 and Paragraph 25 line 5 – "strip" A suggested change by the Examiner is "stripe" to remain consistent with the remainder of the disclosure.
- Paragraph 30 line 4 – "existingt" A suggested change by the Examiner is "existing".
- Paragraph 30 line 15 – "step step" A suggested change by the Examiner is the deletion of one step resulting in just "step".

Appropriate corrections are required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: AUTOMATED RECOVERY FROM DATA CORRUPTION OF DATA VOLUMES IN PARITY RAID DATA STORAGE SYSTEMS.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 11-15, 21, and 22 are rejected under 35 U.S.C. 102(a) and 35 U.S.C. 102 (e) as being anticipated by Tomita (U.S. 2003/0105922).

As per independent claim 1, Tomita teaches,

- receiving a request to read data, wherein the request is received from a computer system in data communication with the RAID data storage system; (Paragraph 96)
- reading first parity data corresponding to the first stripe unit data in response to receiving the request; (Paragraph 102 shown in Figure 6).
- generating new first parity data corresponding to the first stripe unit data, wherein the new first parity data is generated as a function of the first stripe unit data; (Paragraph 87-88 shown in Figure 6)
- comparing the first parity data with the new first parity data; (Paragraph 88 shown in Figure 6 item S605)
- returning data of the first stripe unit to the computer system if the first parity data compares equally to the new first parity data. (Paragraph 102 shown in Figure 6 item 606)

As per dependent claim 2, Tomita teaches, "wherein the RAID data storage system comprises a parity RAID data storage system" (Paragraph 34).

As per dependent claim 3, Tomita teaches, "wherein the parity RAID data storage system comprises a RAID-5 data storage system" (Paragraph 112).

As per dependent claim 4, Tomita teaches, "wherein the new first parity data is generated only as a function of first stripe unit data" (Paragraph 87 shown in Figure 6).

As per dependent claim 5, Tomita teaches,

- if the first parity data does not compare equally to the new first parity data (Paragraph 102-103) *The Examiner notes that the system in paragraph 102 of Tomita, makes a determination of whether the current parity data coincides with previously written parity data. As to the instant claim, paragraph 103 of Tomita teaches that if the determination fails, meaning the parity comparison check shows the two data's as being unequal, the system notifies the host machine of this finding.*
- reading stripe parity P, wherein stripe parity P corresponds to the plurality of stripe units; generating new first stripe unit data as a function of stripe parity P and data of the plurality of stripe units other than the first stripe unit; generating another new first parity data corresponding to the first stripe unit data, wherein the another new first parity data is generated as a function of the new first stripe unit data; comparing the new first parity data with the another new first parity data. (Figure 7 and Paragraph 103). *The Examiner notes that the system of Tomita generates parity data in item S704 of Figure 7. If the parity data that is generated fails the parity check, item S706 of Figure 7 further discussed in paragraph 103, the controller updates the flag indicating that the parity check has failed thus restarting the process. Accordingly, another new parity data is generated on the next pass through the system of Tomita.*

As per independent claim 11, Tomita teaches,

- A computer readable medium storing instructions executable by a first computer system in a RAID data storage system, (Paragraph 40) *The Examiner notes that Tomita teaches a 'software' on a 'host computer' which 'implements a disk array controller.' It is hackneyed in the state of the art to associate instructions embodied on a "computer readable medium" as 'software.' Accordingly, Tomita teaches the limitation of "computer readable medium," as found in the instant claim, with the recitation of 'software.'*
- reading first parity data corresponding to the first stripe unit data in response to receiving a request to read data, wherein the request is received from a second computer system in data communication with the first computer system; (Paragraph 102 shown in Figure 6).
- generating new first parity data corresponding to the first stripe unit data, wherein the new first parity data is generated as a function of the first stripe unit data; (Paragraph 87 shown in Figure 6)
- comparing the first parity data with the new first parity data; (Paragraph 87 shown in Figure 6 item S605)
- returning data of the first stripe unit to the second computer system if the first parity data compares equally to the new first parity data (Paragraph 104).

As per dependent claim 12, Tomita teaches, "wherein the RAID data storage system comprises a parity RAID data storage system" (Paragraph 34).

As per dependent claim 13, Tomita teaches, "wherein the parity RAID data storage system comprises a RAID-5 data storage system" (Paragraph 112).

As per dependent claim 14, Tomita teaches, "wherein the new first parity data is generated only as a function of first stripe unit data" (Paragraph 87 shown in Figure 6).

As per dependent claim 15, Tomita teaches, if the first parity data does not compare equally to the new first parity data

- reading stripe parity P, wherein stripe parity P corresponds to the plurality of stripe units; (Paragraph 102 shown in Figure 6).
- reading data of the plurality of stripe units other than the first stripe unit; (Paragraph 102 shown in Figure 6)
- generating new first stripe unit data as a function of stripe parity P and data of the plurality of stripe units other than the first stripe unit; (Paragraph 87 shown in Figure 6)
- generating another new first parity data corresponding to the first stripe unit data, wherein the another new first parity data is generated as a function of the new first stripe unit data; (Paragraph 87 shown in Figure 6)
- comparing the new first parity data with the another new first parity data. (Paragraph 87 shown in Figure 6 item S605)

As per independent claim 21, Tomita teaches,

- a first computer system for receiving a request to read data, wherein the request is received from a second computer system in data communication with the first computer system, (Paragraph 96)
- wherein the first computer system comprises a computer readable medium that stores instructions executable by the first computer system, wherein the first computer system performs a method in response to executing the stored instructions, the method comprising; (Paragraph 40)

The Examiner notes that Tomita teaches a 'software' on a 'host computer' which 'implements a disk array controller.' It is hackneyed in the state of the art to associate instructions embodied on a "computer readable medium" as 'software.' Accordingly, Tomita teaches the limitation of "computer readable medium," as found in the instant claim, with the recitation of 'software.'

- reading first parity data corresponding to the first stripe unit data in response to the first computer receiving the request; (Paragraph 102 shown in Figure 6).
- generating new first parity data corresponding to the first stripe unit data, wherein the new first parity data is generated as a function of the first stripe unit data; (Paragraph 87 shown in Figure 6)
- comparing the first parity data with the new first parity data; (Paragraph 87 shown in Figure 6 item S605)

- returning data of the first stripe unit to the second computer system if the first parity data compares equally to the new first parity data. (Paragraph 104).

Claim 22 is interpreted under 35 U.S.C. 112, 6th paragraph.

The Court of Appeals for the Federal Circuit, in its en banc decision In re Donaldson Co., 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994), decided that a "means-or-step-plus-function" limitation should be interpreted in a manner different than patent examining practice had previously dictated. The Donaldson decision affects only the manner in which the scope of a "means or step plus function" limitation in accordance with 35 U.S.C. 112, sixth paragraph, is interpreted during examination. Donaldson does not directly affect the manner in which any other section of the patent statutes is interpreted or applied.

When making a determination of patentability under 35 U.S.C. 102 or 103, past practice was to interpret a "means or step plus function" limitation by giving it the "broadest reasonable interpretation." Under the PTO's long-standing practice this meant interpreting such a limitation as reading on any prior art means or step which performed the function specified in the claim without regard for whether the prior art means or step was equivalent to the corresponding structure, material or acts described in the specification. However, in Donaldson, the Federal Circuit stated:

> Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination. (MPEP 2181)

Accordingly, the Examiner notes that the means or system/structure for practice of the invention disclosed in paragraph 19 of applicant's specification is further taught in Tomita as Figure 1.

As per independent claim 22, Tomita teaches,

- means for receiving a request to read data, wherein the request is received from a computer system in data communication with the RAID data storage system; (Paragraph 96)
- means for reading first parity data corresponding to the first stripe unit data in response to receiving the request; (Paragraph 96)

- means for generating new first parity data corresponding to the first stripe unit data, wherein the new first parity data is generated as a function of the first stripe unit data; (Paragraph 87 shown in Figure 6)
- means for comparing the first parity data with the new first parity data; (Paragraph 87 shown in Figure 6 item S605)
- means for returning data of the first parity stripe unit to the computer system if the first parity data compares equally to the new first parity data. (Paragraph 104).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 6-10 and 16-20 are rejected under 35 U.S.C. 103 (a) as being obvious over Tomita (U.S. 2003/0105922) in view of Dekoning (U.S. 6,148,368).

As per dependent claim 6, Tomita teaches, "if the new first parity data compares equally with the another new first parity data" (Paragraph 87 shown in Figure 6 item S605).

Tomita does not teach expressly "further comprising overwriting data of the first stripe unit with the new first stripe unit data" (column 4 lines 26-46).

Dekoning teaches "further comprising overwriting data of the first stripe unit with the new first stripe unit data" (column 4 lines 26-46).

Tomita and Dekoning are analogous art because they are from a similar problem solving area of parity in RAID data storage systems.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Tomita and Dekoning before him/her, to modify the system of Tomita to include the overwriting check method found in Dekoning to allow for data to be "marked 'not in use' or otherwise freed for reuse" (column 4 lines 26-46 of Dekoning).

The motivation for doing so would have been to allow for the system of Tomita to reuse data as the data is marked 'not in use or otherwise freed for reuse' (column 4 lines 26-46 of Dekoning).

Therefore it would have been obvious to combine Tomita with Dekoning for the benefit of overwriting of various parity stripe units which preserves and reuses disk

space (column 4 lines 26-46 of Dekoning) to obtain the invention as specified in claims 6-10 and 16-20.

As per dependent claim 7, Tomita teaches, "further comprising returning the new first stripe unit data to the computer system if the new first parity data compares equally with the another new first parity data" (Paragraph 104).

As per dependent claim 8, Tomita teaches, "further comprising comparing the first stripe unit data to the new first stripe unit data if the new first parity data does not compare equally with the another new first parity data" (Paragraph 103).

As per dependent claim 9, Tomita teaches, "further comprising returning an error message to the computer system if the first stripe unit data does not compare equally to the new first stripe unit data" (Paragraph 103).

As per dependent claim 10, Dekoning teaches, "further comprising overwriting the first parity data with the new first parity data" (column 4 lines 26-46). Tomita teaches, "if the new first stripe unit data compares equally to the first stripe unit data" (Paragraph 87 shown in Figure 6 item S605).

As per dependent claim 16, Dekoning teaches, "further comprises overwriting data of the first strip unit with the new first stripe unit data" (column 4 lines 26-46). Tomita teaches, "if the new first parity data compares equally with the another new first parity data" (Paragraph 87 shown in Figure 6 item S605).

As per dependent claim 17, Tomita teaches, "further comprises returning the new first stripe unit data to the computer system if the new first parity data compares equally with the another new first parity data" (Paragraph 104).

As per dependent claim 18, Tomita teaches, "further comprises comparing the first stripe unit data to the new first stripe unit data if the new first parity data does not compare equally with the another new first parity data" (Paragraph 103).

As per dependent claim 19, Tomita teaches, "further comprises returning an error message to the computer system if the first stripe unit data does not compare equally to the new first stripe unit data" (Paragraph 103).

As per dependent claim 20, Tomita teaches, "if the new first stripe unit data compares equally to the first stripe unit data" (Paragraph 87 shown in Figure 6 item S605). Dekoning teaches, "further comprises overwriting the first parity data with the new first parity data" (column 4 lines 26-46).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached during the hours of 6:30-3:00 M-F (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CPC/mb MB

CHRISTIAN CHACE
PRIMARY EXAMINER